

ABSTRACT OF THE DISCLOSURE

The present invention provides an isolated population of cells containing an expressible nucleic acid encoding proinsulin containing a proinsulin cleavage site and a glucose-regulated expressible nucleic acid encoding a protease capable of cleaving the proinsulin cleavage site to produce insulin. The invention also provides an isolated population of cells which further express a hexosamine synthetic pathway enzyme. The invention additionally provides vectors containing an expressible nucleic acid encoding proinsulin containing a proinsulin cleavage site and a glucose-regulated expressible nucleic acid encoding a protease capable of cleaving the proinsulin cleavage site to produce insulin. The invention further provides a method of treating or preventing diabetes by implanting into an individual cells coexpressing proinsulin containing a proinsulin cleavage site and a glucose-regulated protease capable of cleaving the proinsulin cleavage site to produce insulin.